NTN-SNR INDUCTION HEATERS

Read these operation instructions attentively

INSTRUCTION MANUAL

Fast Therm 20
Fast Therm 35
Fast Therm 150
Fast Therm 300

Control all parts without delay for possible transport damages. If such damages are determined inform the carriers immediately

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1. Safety precautions:

The operation instruction should always be followed

- NTN-SNR shall not be held liable for damages caused by improper handling or by use which does not comply with the designation purpose.
- Prerequisites of the operator:
  - He must be authorized for use
  - He must be familiar with the Safety precautions

DANGER! = High injury risk
WARNING =Potential injury risk
CAUTION = Danger of damaging the device or the work piece
WARNING!
Since a magnetic field (4+5) is generated by the induction heater, people wearing a pacemaker (1) should not work or be in the immediate vicinity of the device. Other sensitive equipment such as wrist watches, magnetic carriers, electronic circuits, etc might also be affected. The Safety distance is 1 meters (38")

The equipment should not be used in areas where there is a risk for explosion.

Use protective gloves (danger of burning your hands). Delivered gloves (7) are suitable up to 150°C (302°F). Type Oil Tuff, 52-647, made by Ansell.

Hot surface avoid contact (4)

Wear Safety Shoes (8)

a. CAUTION

All repair work should be taken care of by an official NTN-SNR distributor.
Use original spare parts only.
Protect heater from water or very high humidity.
Protect the yoke support and yokes against corrosion, damage and deformation.
Only preheat ball bearings to max 110°C (230°F).

b. Safety precautions

- The user should have an appreciation of the contents of this manual, and be familiar with safe workshop practice
- Follow the User Manual at all times.
- Ensure that the machine operates at the correct supply voltage. The heater is supplied with a plug, change the plug should only be made by a suitably qualified person.

- Do not use or store the heater in humid environments. NTN SNR induction heaters are designed for indoor use only.
- Use proper handling equipment, appropriate for the weight of the work piece or yoke. Never support arts with a metal cable or have anything metallic hanging in the proximity of the magnetic field. Extremely high currents can flow through the cable, causing the cable to heat up.
- Do not hold metal objects near the yokes and poles

c. Safety precautions

- Place heater only on a horizontal surface.
- Keep distance to surrounding object by minimum of 1 meter (38")
- Use only in well ventilated location.
- Prevent to heat up object containing Oil, grease or similar due to possible generator of fumes and smoke.
- Do not inhale/breath fumes or smoke
- Do not move or lift heater after heating process when warm
- Do not rout supply cable through the core.
- While heating keep at least 1 meter (38") distance from the heater.
- Never remove the yokes during the heating cycle.
- Do not modify the heater and do not use self-fabricated yokes.
- Always check that the yoke is correctly adjusted to the poles otherwise excessive vibration may occur.
- Only switch the machine on when the yoke is positioned correctly- on models equipped with a pivoting yoke, the yoke should always be closed.

Note: Since our products are subject to continuous improvement, we reserve the right to change the content of this document.

d. Safety features:

- The heater will automatically switch off if the temperature of coil or heat sink is higher than 120°C (248°F). Let the heater cool down for 30 minutes and turn on the heater again (E 06).
- When using temperature mode, the heater will switch automatically if the rate of temperature rise is too low (E 03).

An induction heater works due a magnetic field. In figures below there are some measured values of the flux density in milliTesla (mT). These measurements can be used as a guide in conforming to local regulations regarding the maximum time exposure of people to magnetic fields. The values below are only valid for a combination of bearing type and yoke bar. Different configurations may give different values due to the large variety of bearing types in combination with the different yoke bars.

Fast Therm 20

Distance cm	0	10	20	30	40	50
X mT	2.95	0.76	0.21	0.11	0.09	0.07
Y mT	3.74	0.84	0.32	0.16	0.11	0.09

Fast therm 35

Distance cm	0	10	20	30	40	50
X mT	4.26	1.12	0.35	0.16	0.11	0.08
Y mT	3.58	1.66	0.56	0.27	0.16	0.09

Fast therm 150

Distance cm	0	10	20	30	40	50	60	70
X mT	13.5	3.4	1.5	0.6	0.3	0.19	0.09	0.08
Y mT	3.58	1.66	0.56	0.27	0.16	0.09	0.1	0.09

Fast Therm 300

Distance cm	0	10	20	30	40	50	60	70	80	90
X mT	2.4	1.9	0.69	0.4	0.3	0.23	0.16	0.15	0.09	0.08
Y mT	1.77	1.13	0.69	0.4	0.3	0.23	0.16	0.15	0.13	0.09

WARNING!
We advise a Safety distance of at least 1 meter (38”) for people.
CAUTION!
The machine works through an induction field. Bear in mind that this can influence electronic equipment, e.g. watches, magnetic charts etc.

2. Introduction:

The NTN SNR induction heaters are intended for heating rolling bearings. Other metal components forming a closed circuit such as bushings, shrink rings, pulleys and gears can also be heated. This will facilitate mounting where an interference fit is required.
The heaters are designed to heat the work piece up to a maximum temperature of 240ºC (464F).

NTN SNR heaters can be used on continuous bases.
By heating with the time function this has to be checked with an external temperature meter.
Always place the temperature sensor to check while the first heating.

Caution:
Bearings generally should only be heated up to a maximum temperature of 120ºC (248ºF).
Do not use induction heaters for bearings or work pieces, which are outside the minimum or maximum dimensions as specified in this manual.
Do not switch off the heater with the main switch while heating cycle is running.

e. Operation condition:

The heater is designed to be used in an industrial environment with an ambient temperature of 0°C to 40°C (32°F to 104°F) and an atmospheric humidity of 5% to 90%. The induction heater is meant for indoor use only.

3. Installation:

- Remove packing material and place the induction heater on a non-ferrous, stable, flat surface. The box will normally contain the heater, a yoke or a set of yokes, the temperature probe and a pair of heat-resistant gloves.
- Check that the supply voltage and current meet the specifications on the type plate to be found on the back of the machine.
- As there are a large number of plug types, every NTN SNR induction heater is provided with a plug. When the plug does not fit to your power supply, a suitable plug has to be set by a qualified electrician.
- The wires should be connected as follows:
  - Fast therm 20 + 35: Braun (Black us): Phase, blue (White us): neutral, Green / yellow: ground.
  - Fast therm 150 + 300: Phase, blue (black us) , Phase Brown (black us) Ground: Green / yellow:
- Make sure that the supply cable cannot come into contact with the bearing that is to be heated. Insert the plug into a shockproof wall socket.
- Connect heater to electric mains,
- Keep distance to surrounding object by 0.5meter (19”)
- Turn main switch from 0 to 1
- The heater will emit a short beep and in the display 110°C (230F) will appear.
- The induction heater is now ready to be used.

4. Setting up the work piece

WARNING!
Use appropriate hoisting equipment for heavy components and yokes. The manual lifting of heavy objects is a common cause of injury.

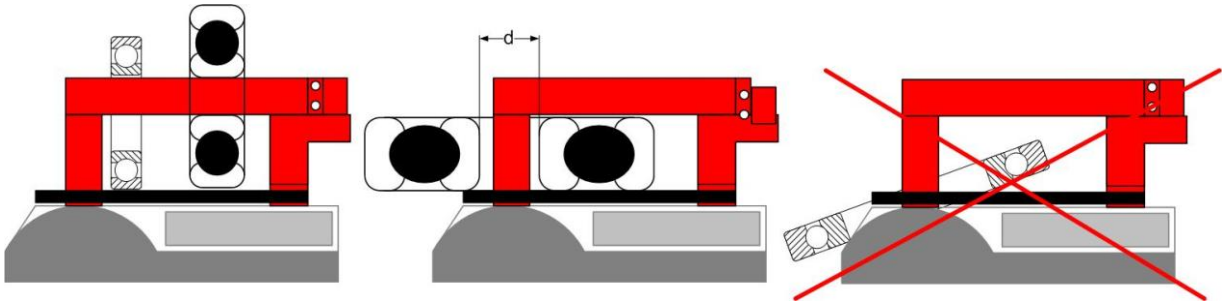
Wear Safety Shoes while the inductor yokes can slip out of your hands.

The weight of the work-piece should not exceed the maximum weight shown in drawing below. Exceeding these limits may result in catastrophic equipment failure leading to personal injury.

Ensure that the mains cable cannot come into contact with the work piece. Damage to the cable may result in electrocution.

Never support components with a metal cable or have any hanging in the proximity of the magnetic field. Extremely high currents can flow through the cable causing it to heat up quickly, resulting in a risk of burning

The work piece can be set up in two different ways:

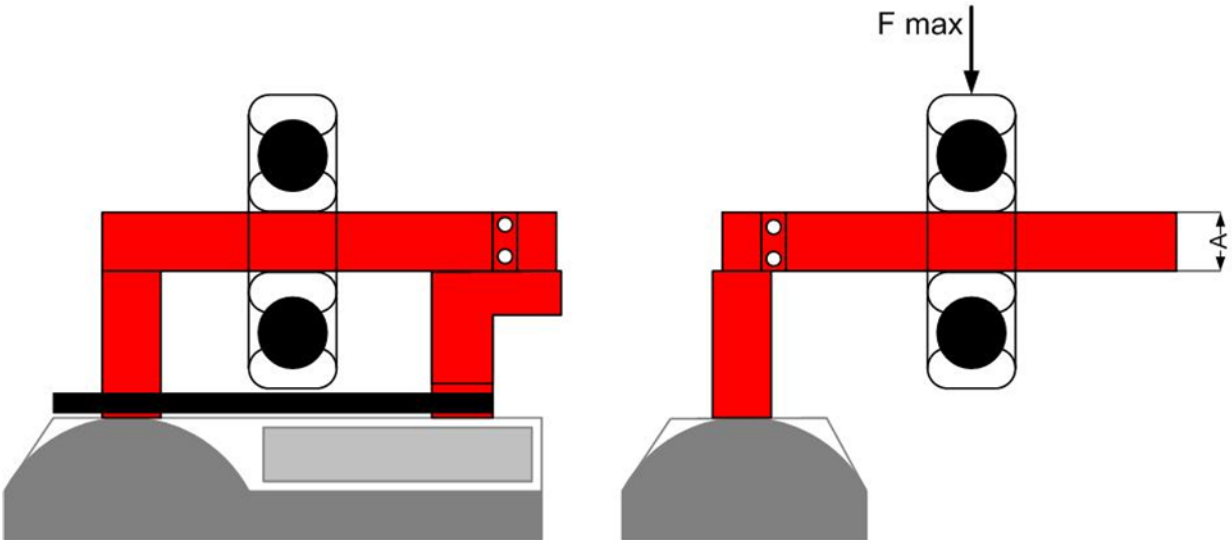


Vertical **Horizontal**

Vertically and Horizontally: The part may never touch the housing.
Small objects to be heated in horizontally position

Fast Therm 20 **Max. dimensions part:**	**Fast Therm 35** **Max dimensions part:**
Max inner diameter (d): 160mm (19.7”) Min inner diameter (d): 15mm (0.6”) Max outer diameter (D): 280mm (11”) Min outer diameter (D): 20mm (0.8”) Max height (C): 85mm (3.3”) Max weight part (bearing or solid): 20KG (44 lbs)	Max inner diameter: 240mm Min inner diameter: 15mm Max outer diameter: 370mm Min outer diameter 25mm Max height: 125mm Min weight part 5Kg Max weight part (Bearing): 40KG (Max Weight part (solid) : 40KG

Fast Therm 150 **Max dimensions part:**	Fast Therm 300 **Max dimensions part:**
Max inner diameter: 240mm Min inner diameter: 30mm Max outer diameter: 470mm Min outer diameter 40mm Max height: 200mm Min weight part 10Kg Max weight part (Bearing): 150KG Max Weight part (solid) : 80Kg	Max inner diameter: 300mm Min inner diameter: 60mm Max outer diameter: 700mm Min outer diameter 80mm Max height: 300mm Min weight part 15kg Max weight part (Bearing): 300KG Max Weight part (solid) : 150KG



Maximum weight part for the pivoting yoke:

Fast therm 35	Fast Therm 150	Fast Therm 300
Max weight (F)	Max weight (F)	Max weight (F)
8KG (17 lbs)	12KG (26 lbs)	20KG (44 lbs)

Parts heavier have to be heated horizontally

5. Fast therm 20 operating instructions

Do not start the heating process without using a bar

- Connect the machine (according to the type in 110 or 230V-16A) and attach the magnetic sensor. Set the contactor to position « I ».

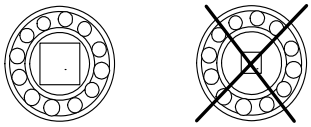
The display reads 110°C.

- Choose the most suitable bar for the bearing to be heated. The bar should fill the bearing bore as completely as possible (sketch N°3). Slide the bearing over the bar.

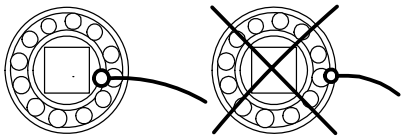
Heating can take place in temperature mode.

Place the magnetic sensor on the inner ring. (sketch n°4)

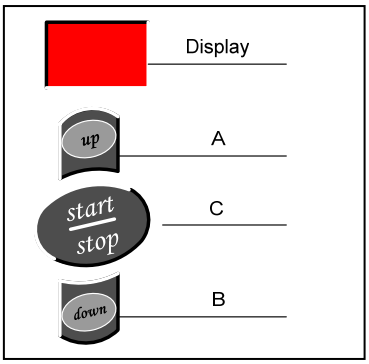
Sketch n°3



Sketch n°4



USEFUL TIP: apply a light coat of grease or Vaseline to the bar cross-section, this will help avoid vibrations.



When the equipment is running, the default display on the screen is 110°C.
By pressing keys A and B, you can raise or drop the temperature.

Press the key C « START/STOP » to begin heating. The screen begins to show the temperature from 50°C. Once the required temperature is reached, an audible signal is heard and the screen flashes. Press « START/STOP » to stop the signal. Remove the part.

Nota - Heating restarts as soon as the temperature drops by 5°C. It will do this 5 times in succession, after which an audible signal is heard. Press the « START/STOP » key to stop it and remove the sensor. Remove the part.

HEATING CAN BE STOPPED AT ANY TIME BY PRESSING THE « STOP » KEY.

6. Fast Therm 20, 35, 150 and 300 operating instructions

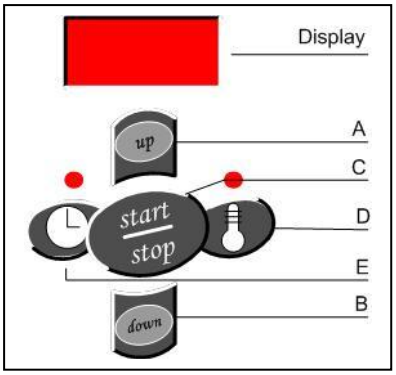
Do not start the heating process without using a bar

1- Connect the equipment (according to the type in 110 or 230V-16A for THERM 20 and 35 and according to the type in 400 or 480V-63A for THERM 150 and 300) and attach the magnetic sensor. Set the contactor to Position « I ». The display reads 110°C.
2- Choose the most suitable pivoting arm for the bearing to be heated. The bar must fill the bearing bore as completely as possible. Slide the bearing over the bar.
3- Heating can then take place in either time or temperature mode

USEFUL TIP: apply a light coat of grease or Vaseline to the bar cross-section, this will help avoid vibrations.

Temperature mode
Place the magnetic sensor on the inner ring (sketch n°4). Select temperature mode by pressing key D.
Once the machine is running the screen will display 110°C by default.
You can press keys A and B to raise or drop the temperature. Press the « START/STOP » key to begin heating. The screen will show the temperature as from 50°C. Once the desired temperature is reached, a signal is heard and the screen flashes. Press « START/STOP » to stop the signal. Remove the part.

Time mode

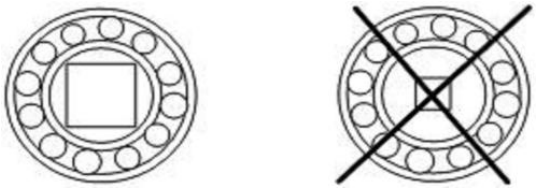


Switch on the equipment. Press key E. The machine displays « 00.00 ». Set the heating time in seconds by pressing keys A and B. After setting the seconds, adjust the time in minutes by pressing key E and then use keys A and B.
Select the desired time (max 99.59 min) and press the « START/STOP » key to begin heating. The count-down will then begin on the time display.
During heating, the temperature can be displayed by pressing key F. **The magnetic sensor must then be in place.** (Sketch n°4)
Once heating is over, the signal is heard. Press the « START/STOP » key to stop it. Remove the part

Nota - *heating restarts as soon as the temperature drops by 5°C. It will do this 5 times in succession, after which an audible signal is heard. Press the « START/STOP » key to stop it and remove the sensor. Remove the part.*

HEATING CAN BE STOPPED AT ANY TIME BY PRESSING THE « STOP » KEY.

- Put magnetic probe on work piece close to the bore. Make sure that the place reserved for the probe is free of any grease or oil



Sketch N° 3

Sketch N°4

- Always use magnetic temperature probe (hereafter referred to as the “probe”) for heating in the temperature mode.
- The probe is suitable for operation up to a maximum temperature of 240°C (484°F)
- As a safety feature, the connection between magnet and probe will break above the maximum temperature. If this occurs when operating in the temperature mode, the machine will turn itself off since the probe will fail to register any increase in the temperature over a set of period of time.
- A probe fixed to a clamp is also available when heating non-magnetic work pieces.
    - Ensure that the area where the probe is located is completely clean.
    - Connect the probe by inserting the plug into the socket at the side of the heater, **watch out for + - !**

CAUTION:
Treat the probe with care. It is a valuable part of the heater and can easily be broken through careless handling. After use, we suggest that it is placed on the side of the vertical pole.

WARNING!
If in any doubt, isolate the machine and contact your local distributor.

AT ALL TIMES PROCESS CAN BE INTERRUPTED BY PRESSING "STOP"

7. Malfunctioning / Error Signals:

E 01: The probe is not plugged in or the cable of the probe is broken
E 02: The probe is not correct connected, please check.
E 03: The increase of temperature is lower than 1°C in 1 minute.
Please check:

- The probe, no damage and placed properly
- The part can be too big for the machine (heating time to long).

E 04: No change in Temperature

- The probe, no damage and placed properly.
- The connection from probe to the circuit board.

E 06: Coil or heat sinks are too hot (more than 120°C)

- Inform your distributor

E08: No zero crossing Triac

- Inform your distributor

Press “start/stop” and check which of above possibilities is causing the Error signal.

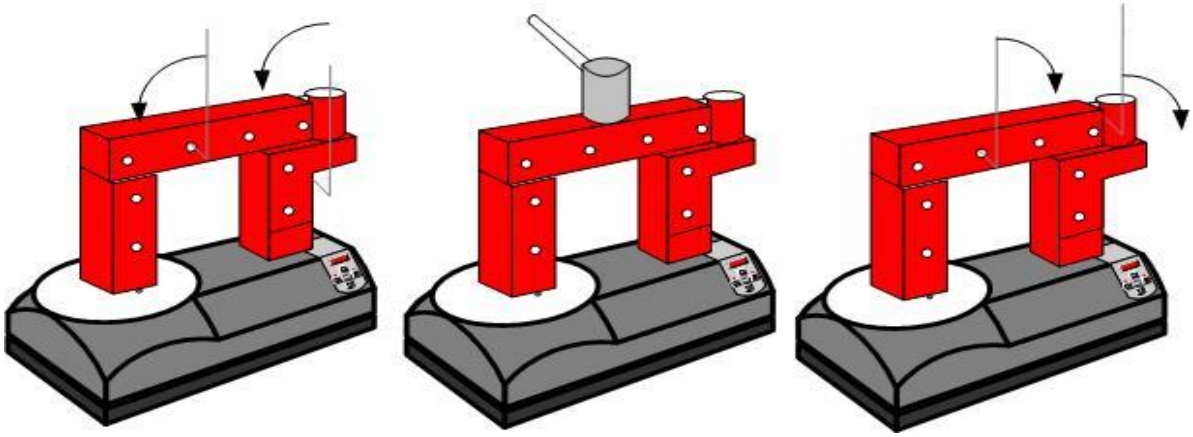
If a loud vibrating noise heard, first check:

- Are the contact surfaces clean and greased sufficiently?
- Are the yokes 100% in contact with the surface?

Adjustment yokes:

1- Check if the grinded side is smooth.
2- Place yoke or pivoting yoke on the heater.
3- Unscrew the screws in yoke and pivoting point an 1/4 turn.
4- Turn on the heater and the yoke will set itself or use a nylon hammer.
5- Fasten screws and turn off heater.

3 **4** **5**



WARNING!: If in any doubt, isolate the machine and contact your local distributor

8. Cleaning and maintenance:

- Store in a dry, frost-proof area, free from humidity.
- Keep clean with a soft, dry cloth.
- Keep the contact parts of the poles clean. Grease regularly with an acid free grease for optimal contact with the yokes and to avoid corrosion (on swing-arm models, also grease the vertical pin regularly).
- Contact your supplier if there is any suspicion of malfunctioning.

WARNING!
Proper maintenance and handling practices are critical. Failure to follow installation instructions and to maintain proper lubrication can result in injuries.

9. Technical data

Type	**Fast Therm 20**
Voltage	115V-15A-60Hz / 230V-16A-50Hz
Power	1.8 / 3.6KVA
Temperatures control	Max.110ºC (230ºF)
Heating speed control	Microprocessor controlled
Overall dimensions	355x280x205mm (14” x 8” x 11”)
Max. weight work piece	Solid components: 20 kg (44 lbs)
Bearing	20 kg (44 lbs)
Mass. heater	17 kg (37lbs)
TYPE:	**Size**
Induction yoke	
TOOL FT20-YOKE 10	7x7x200
TOOL FT20-YOKE 15	10x10x200
TOOL FT20-YOKE 20	14x14x200
TOOL FT20-YOKE 35	25x25x200
TOOL FT20-YOKE 60	40x40x200
Magnetic probe	
Control unit (high- and low voltage)	
Main switch	
Set of rails	

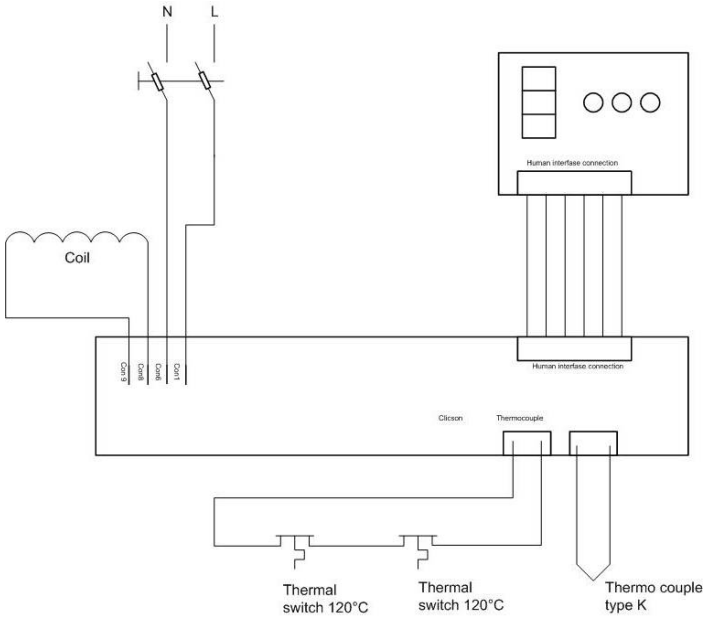
Type	**Fast therm 35**
Voltage	115V – 15A – 60Hz /230 V 16 A – 50 Hz
Power	1.8KVA
Temperatures control	Max. 110°C (230°F)
Heating speed control	Microprocessor controlled
Overall dimensions	355x280x205mm (14” x 8” x 11”)
Max. weight work piece	Solid components: 40 Kg (88 lbs)
Bearing	40 Kg (88 lbs)
Mass. heater	17 kg (37lbs)
TYPE:	**Size**
Induction yoke	
TOOL FT35-YOKE 20	14x14x280
TOOL FT35-YOKE 35	25x25x280
TOOL FT35-YOKE 60	40x40x280
TOOL FT35-YOKE 70	50x50x280
Magnetic probe	
Control unit (high- and low voltage)	
Main switch	
Set of rails	

Type	**Fast Therm 150**
Voltage	460V-20A-60Hz / 400V-20A-50Hz
Power	12.8 KVA
Temperatures control	Max. 110°C (230°F)
Heating speed control	Microprocessor controlled
Overall dimensions	405x280x205mm (16” x 8” x 12”)
Max. weight work piece	Solid components: 80 kg
Bearing	150 kg
Mass. heater	32 kg (74lbs)
TYPE:	**Size**
Induction yoke	
TOOL FT150-YOKE 30	20x20x350
TOOL FT150-YOKE 45	30x30x350
TOOL FT150-YOKE 60	40x40x350
TOOL FT150-YOKE 70	50x50x350
TOOL FT150-YOKE 85	60x60x350
TOOL FT150-YOKE 100	70x70x350
Magnetic probe	
Control unit (high- and low voltage)	
Main switch	
Set of rails	

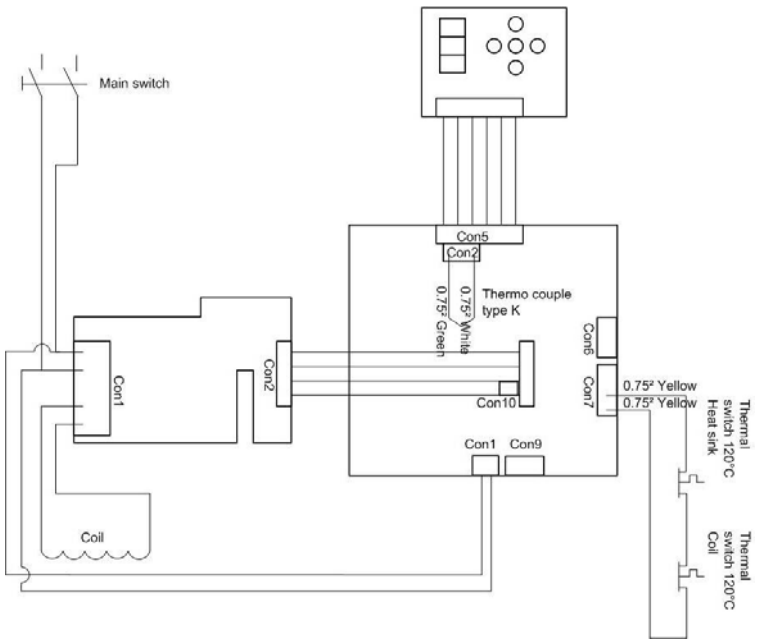
Type	**Fast therm 300**
Voltage	460V-30A-60Hz / 400V-20A-50Hz
Power	12.8 KVA
Temperatures control	Max. 110°C (230°F)
Heating speed control	Microprocessor controlled
Overall dimensions	905x3500x700mm (35x13.7”x27”)
Max. weight work piece	Solid components: 150 kg Bearings: 300kg
Bearing	75 kg (165lbs)
Mass. heater	Fast therm 300
TYPE:	**Size**
Induction yoke	
TOOL FT300-YOKE 30	20x20x490
TOOL FT300-YOKE 45	30x30x490
TOOL FT300-YOKE 60	40x40x490
TOOL FT300-YOKE 70	50x50x490
TOOL FT300-YOKE 85	60x60x490
TOOL FT300-YOKE 100	70x70x490
TOOL FT300-YOKE 115	80x80x490
Magnetic probe	
Control unit (high- and low voltage)	
Main switch	
Set of rails	

10. Electrical Drawing

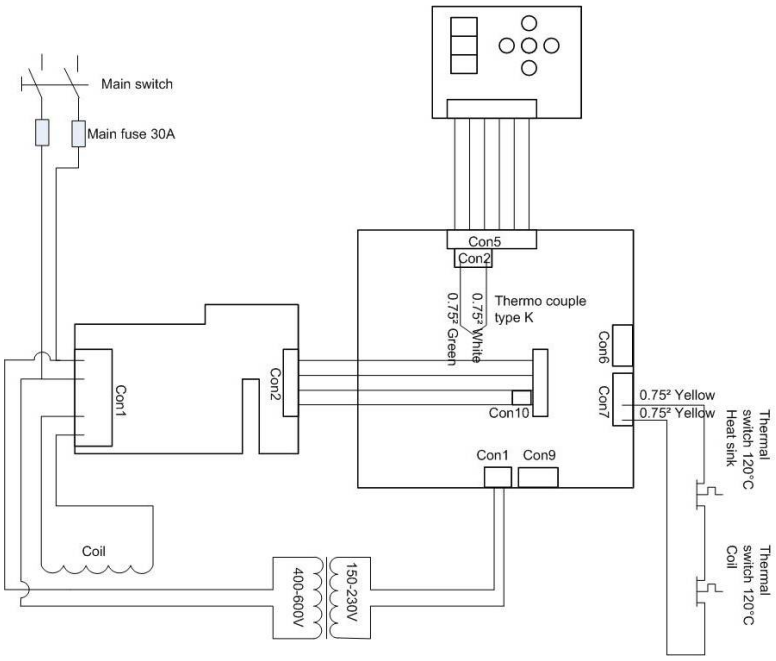
Electrical drawing Fast therm 20:



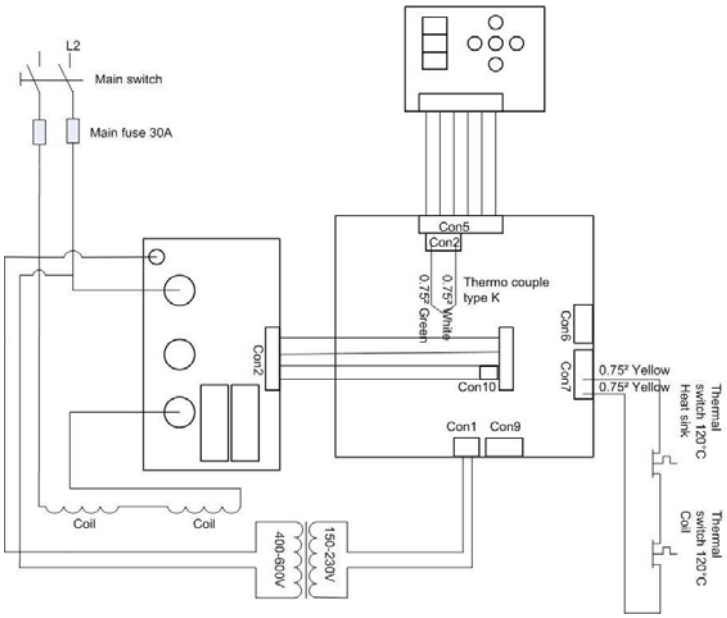
Electrical drawing Fast Therm 35:



Electrical drawing Fast Therm 150



Electrical drawing Fast Therm 300



11. Declaration of conformity

Manufacturer: NTN-SNR Bearing
Address: 1 rue des usines 74000 Annecy France

Herewith we declare that the supplied version of:

Name product: Induction heater
Type product: Fast Therm 20 / 35 / 150 /300

Complies with the following provisions applying to it:

Electrical Safety:	IEC 335-1 classification 1 IEC 664-1 Category 2
EMC emission:	EN 55011 (1998) + A1 (1999) + A2 (2002) EN 61000-3-2 EN 61000-3-3
EMC immunity:	EN 61000-6-2

Other information:
This product complies with technical standards specifications as defined by low voltage directive 73/23/EEG and EMC directive 89/336/EEC

Induction Heating Systems : Warranty Terms and Conditions

NTN-SNR guarantees this product to be free from defects in material and workmanship for a period of 3 years from date of purchase. It remains the customer's responsibility to provide proof of this date of purchase. During the warranty period NTN-SNR will either repair or replace any product that proves to be defective.

Limitations :

This warranty does not apply to defects resulting from product modification or misuse of any product or part without NTN-SNR's written consent. Furthermore, this warranty does not apply to fuses or problems arising from normal wear or failure to follow instruction.

Neither NTN -SNR nor it's employees shall be liable for any direct or indirect damages arising either out of any defects in the products or the use of the products, even if SNR has been informed in advance of the possibility of such damage. Such excluded damages shall include, but are not limited to: costs of removal and installation, losses substained as the result of injury to any person, or damage to property.